

Exhibit “E”

Stan V. Smith
 Corporate Financial Group Ltd
 1165 N. Clark Street, Ste 650
 Chicago, IL 60610
Tel: 312-943-1551; FX - 1016

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Hedonic Damages and Personal Injury: A Conceptual Approach

Edward P. Berla, Michael L. Brookshire and Stan V. Smith*

This article describes a conceptual approach for applying estimates of the loss of the pleasure of life—estimates of “hedonic” damages—to personal injury cases. To our knowledge, no such system has been previously discussed. Forensic economists will note that this interdisciplinary approach involving psychologists and economists is analogous to the interrelated work of vocational experts and economists in personal injury cases. It is the greater predictability of fair jury awards, derived from the approach herein described, which may cause this new approach to be of interest to both plaintiff and defense attorneys.

I. Introduction

This article describes a conceptual approach for applying estimates of the loss of the pleasure of life—estimates of “hedonic” damages—to personal injury cases. To our knowledge, no such system has been previously discussed. Forensic economists will note that this interdisciplinary approach involving psychologists and economists is analogous to the interrelated work of vocational experts and economists in personal injury cases. It is the greater predictability of fair jury awards, derived from the approach herein described, which may cause this new approach to be of interest to both plaintiff and defense attorneys.

II. Background

The value of intangible losses, such as pain and suffering, that result from personal injury has often been presented by a plaintiff attorney to a jury based upon some naive formula. For example, it might be argued that pain and suffering losses are two- or three-times earnings loss. In recent years, psychologists have been used as expert witnesses in personal injury cases to qualitatively establish the extent to which an injury has affected a person's life. Through interviews with this person and his or her family, psychological tests, and research, the psychologist arrives not only at a diagnosis but also a judgment as to the severity of the injury upon a person's functioning.

In a personal injury case, juries may also be asked to consider the loss of the pleasure of life. Economists and financial experts have sometimes been asked to testify in this area, but, again, a system for rating and quantifying such damages in personal injury cases has not been developed and communicated.

III. Major Issues

In developing an approach for calculating economic damages of this nature, the following issues emerged:

1. Scale: How can a scale be developed for assessing the degree of lost pleasure of life over time that resulted from particular injuries to a particular person? What units of measure should calibrate the scale: abstract units of the utility of life, hours, etc.?

* Ed Berla is a Clinical Psychologist and Professor at the University of Louisville, Michael L. Brookshire is a Professor of Economics at the University of West Virginia College of Graduate Studies in Charleston, and Stan V. Smith is an Adjunct Professor of Economics at the DePaul University College of Law in Chicago.

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2. Theory of Hedonic Loss: What is the most reasonable theoretical underpinning for economic losses in this area—a replacement cost theory, an avoidance theory, or a theory of what governments and corporations spend to avoid a person's death or injury? Stated another way, how can the total loss of the pleasure of living be estimated by economists as the foundation for applying a loss scale for injury?
3. Value: How are units of loss to be converted to dollars of loss per year? Should minimum wages be used, average wages of workers, the person's own likely wage, or dollars which may be spent by persons or society to preserve the value of living?
4. Pleasure versus Pain: Can the losses from the diminution of the pleasure of living be sufficiently separated from the losses resulting from the onset of palpable pain and suffering?

IV. The Lost Pleasure of Life (LPL) Scale

A scale has been developed to measure the degree of lost pleasure of life that is independent of the traditional, imprecise concept of pain and suffering. As will be seen, the hedonic approach focuses upon the value placed on a person's life. A psychological evaluation determines the degree of the lost pleasure of life resulting from an injury. “Pleasure of Life” is used to mean the value and satisfaction that we receive from all of living, including the experiences not always deemed pleasurable. This is distinct from the impacts associated with the onset of palpable pain and suffering and its consequences.

The loss of the pleasure of life, or change in quality of lifestyle, can be divided into four very broad areas, and an injured person is evaluated in these four areas. The psychologist's evaluation compares the person's post-injury lifestyle with his or her pre-injury lifestyle. The four areas are:

1. Practical functioning. This refers to a person's ability to live on a daily basis free of any debilitating emotional problems that diminish his capacity to enjoy life and compromise one's sense of self-worth, dignity, and integrity.
2. Emotional/psychological functioning. This refers to a person's ability to live on a daily basis free of any debilitating emotional problems that diminish his capacity to enjoy life and compromise one's sense of self-worth, dignity, and integrity.
3. Social functioning. This refers to a person's capacity to derive pleasure from interacting with other people. Examples include family interactions, athletic activities, social events, hobbies, and any other interpersonal interactions.
4. Occupational functioning. This refers to a person's ability to engage in a career/vocation of one's choice and to derive pleasure from one's occupational identity independent of any monetary compensation.

Table 1
Lost Pleasure of Life (LPL) Scale

Degree of Loss		Examples
None	0	
Minimal	1-17%	Person is involved in automobile accident and misses some days of work; family functioning and relationships disrupted for days. Person returns to "pre-injury" level of functioning.
Mild	17-33%	Person breaks arm which results in a permanent inability to participate in recreational activities. Person has infrequent occurrences of mild depression. All other aspects of practical, emotional, social and occupational functioning are at a pre-injury level.
Moderate	33-50%	Person loses leg in car accident, which affects his practical functioning on a daily basis; recreational activities are restricted and he suffers infrequent occurrences of mild depression.
Severe	50-67%	Person is burned in a fire and experiences significant scarring. Social functioning substantially reduced, person experiences significant loss of self-worth and frequent periods of depression. Practical and occupational functioning remain at preinjury level.
Extreme	67-83%	Person is quadriplegic and requires attendant care on a daily basis. Practical, social and occupational functioning are significantly diminished. Person experiences severe depression and loss of a sense of self-worth.
Catastrophic	83-100%	Person is bedridden requiring daily nursing care. All aspects of practical, emotional and social functioning are substantially reduced. Person is unable to work.

Through the use of psychological tests, questionnaires, and interviews, a judgment can be made concerning the degree of an individual's hedonic loss in these four areas. These losses can then be quantified by using a seven-point scale that rates an individual's percentage of loss (see Table 1). The Lost Pleasure of Life (LPL) Scale is similar to those used by mental health professionals to assess the degree of functioning and the severity of stress in individuals (*Diagnostic and Statistical Manual of Mental Disorders*, pp. 11, 18-19). Using this scale, the mental health professional assigns a value of 0 to 100, with reference to the four areas of functioning described above. A zero rating means that an individual has lost nothing in functioning, while a 100 rating means that the individual is completely unable to function and cannot derive any pleasure in a particular area.

The mental health professional makes these ratings and judgments based upon his knowledge of the specific injury the individual has sustained and its probable effect on that individual's future life. This requires the professional to have an understanding of the stages of life that all humans experience and the relationship between the injury and future stages of a person's life. An individual will experience

an injury differently, depending upon his age and stage of life. For example, a specific injury, such as a leg amputation, will be experienced differently and will have different consequences for an individual if it is sustained at middle age, rather than during childhood. Using the LPL scale, the mental health professional rates an individual's degree of diminution of life that has been experienced from the date of injury to the date of the evaluation and then estimates the degree of diminution of life over the individual's remaining life span. The degree varies as a function of the injury, the time that elapses after the injury, and the age of the individual.

As another example, an individual who has been badly burned will have his life significantly affected in all four areas of functioning for a period of one-year following the fire. He might be rated as having a 95 percent diminution of life (catastrophic). In subsequent years, the effect on his occupational and practical functioning might be changed to a mild loss (32 percent and 25 percent, respectively), while the effect on his social and emotional functioning would remain catastrophic (95 percent). His total or combined degree of diminution of life in this example with equal weighting would now be the average of these, or 62 percent (the severe category).

Thus, the psychologist's report would provide an economist with a percentage-of-loss, or range of such percentages, for each future age or stage of life. This age-by-age, or stage of life, analysis of the four possible areas of lost functioning would result in percentages that can be applied to dollar estimates of the (lost) pleasure of life per year by a forensic economist.

V. Quantifying The Lost Pleasure of Life

Assume that a psychologist has provided a percentage of the total (lost) pleasure of life for each age. Several theoretical approaches are available to a forensic economist for determining a dollar value for the total (100 percent lost) pleasure of life in each year. The psychologist's percentage applied to the dollar value of total (lost) pleasure of life would result in a hedonic damages estimate for each year or stage of life.

One such approach to deriving at hedonic values might be labeled the "societal value" approach. It is the predominant economic model for valuing life in the courts and is based on the willingness-to-pay (WTP) economic model. Testimony regarding the lost pleasure of life in wrongful death cases based on the willingness-to-pay model is being presented with increasing frequency. In this approach, the price associated with a change in the risk of death is estimated in several different ways through questionnaire studies, consumption studies, labor market studies, and studies analyzing the cost and impact of regulations imposed by rulemaking agencies. Most estimates range from high six-figure amounts to high seven-figure amounts. Among others, Bloomquist (1981) and Fisher, Chestnut, and Violette (1989) have summarized such estimates. The economist must choose the range of estimates that he will utilize and provide a rationale for choosing a central tendency measure or a range of values.

Economists may differ in their precise estimate of the value of life just as they will frequently differ as to the value of lost earning capacity. Estimates may vary for many reasons, including differences in discounting, growth projections, etc.

From the willingness-to-pay based estimate for the total value of life, we must subtract estimates of the labor component (earnings, fringe benefits, household services) for a statistically unknown person. Further, we must subtract an estimate for the value of preserving financial security, since this too is included in the total life value. The remaining "net" hedonic value may then be divided by the remaining life expectancy of a statistically average person to arrive at a hedonic value per year of life expectancy. Assume that the forensic economist has established this net hedonic value at \$50,000 per year. Percentages of total lost pleasure of life would be applied to this \$50,000 total, hedonic value per year. The application of the life expectancy of the injured person, and adjustments for annual growth in these values and discounting, would result in a present value of the lost pleasure of life or a range of such values.

A second approach to hedonic valuations, which has been used, might be labeled an "individual avoidance" approach. Under such an approach, the following question is asked. How much could or would the injured person have paid to avoid his lost pleasure of life in each year? Surely this must primarily depend upon his or her earning capacity. To be conservative and for ease of explanation, the economist may abstract from possible borrowing, gifts, or other funding sources to avoid the lost pleasure of life. Loss in dollars would be exclusively linked to earnings potential in wages, salary, and other direct forms of compensation.

How much could or would one work to avoid the 100 percent extreme of LPL? A reasonable number of hours per week seems to be 80 hours, or double the "normal" work week. We know that persons have maintained such a work schedule over time. It is not desirable, but we are focusing upon what a person would do to avoid the catastrophic loss of the pleasure of life. As one moves above an 80-hour "avoidance week," the credibility of the approach deteriorates. Even if a person would take major steps to avoid LPL, some sleep and personal time per week are necessary.

An issue now becomes the integration of an economist's estimate of lost earning capacity with his LPL estimate. Assume that John Doe suffers a severe injury on December 31, 1988; cannot work in 1989 and receives the \$20,000 in wages that he otherwise would have earned; and has the extreme of a 100 percent LPL rating. His \$20,000 in wages, plus his fringe benefits, would be captured in the earning capacity loss estimate of 1988; this would presumably cover 40 hours per week. The LPL estimate would be the 100 percent rating times \$20,000, or a \$20,000 loss in this simple example. If the rating percentage from the psychologist had been 50 percent, LPL for 1989 would be \$10,000, with a lost earning capacity plus LPL estimate of \$30,000.

The 40-hour-per-week lost earning capacity estimates would only continue through work-life expectancy. Standard tables might produce an age 62 end of work-life and age 75 end of life, although the life-participation-employment (LPE) model of work-life expectancy lends itself to the LPL system (Brookshire and Cobb, 1983). In our example, we have 40-hour-based estimates for both earning capacity and LPL through age 62. Then, the LPL estimate is based upon 80 hours per week of individual avoidance (times the percentage rating) at each age through life expectancy. In the case of a mother and housewife, who had no plans to work, 80 hours

per week might exist in LPL throughout her life expectancy under the individual avoidance theory. Her wage potential might be based upon statistical averages for her demographic characteristics, but such estimates are commonly made in minor child and other cases involving lost earning capacity. Care must be taken, however, to be sure that an 80-hour estimate of LPL does not double-count with an hours-per-week estimate of lost household services.

Finally, other variations of a generalized willingness-to-pay approach have been presented to juries. The cost of maintaining maximum security prisoners, or of an indigent patient in a vegetative condition, have been used as benchmark values of how much society is willing to pay to preserve life. Such approaches also assign hedonic losses to particular ages and particular years, so that percentages from a psychologist can be applied in injury cases.

VI. An Illustration

To further illustrate these methods, let us use a version of a past case. Several years ago, a teenage female suffered a severe spinal injury when the automobile in which she was a passenger swerved off the road and overturned. Karen Doe spent a year in and out of the hospital undergoing several operations. The short term effects were dramatic, as this teenager spent the better part of a year in a body cast. The long term effects on her life are significant: her weakened back will never allow her to lift or carry more than a few pounds in her arms. It was clear that the accident would affect and alter every day of her future and that she would suffer a loss of the normal pleasures to which she would have otherwise looked forward.

The core of the psychologist's report in the Karen Doe case is shown in Table 2. The psychologist could be more specific about an LPL rating for each age, or the economist can apply the low and high percentage values of a range to his yearly estimate of the total (lost) pleasure of life. Under the societal value approach, we already assumed a \$50,000 value per year to which the percentages would be applied through Karen's life expectancy. A second-shift avoidance amount might be based on a likely educational level scenario for Karen. If this were a high school degree with some college, a base earnings estimate would be in the \$20,000-\$25,000 range. The amount of reductions to the earning capacity estimate for work-life probabilities, such as retirement, would shift to the LPL estimate. The same percentages from the psychologist's report would then be applied to these estimates of total (lost) pleasure of life for each year in present values.

VII. Further Issues and Refinements

The percentage of growth in annual losses, whether in nominal or real terms, should be the same in the LPL estimate and in the earning capacity estimate under an individual avoidance approach (Brookshire, 1987). Similarly, discounting to present values should be at the same interest rates for LPL and lost earning capacity estimates. Juries should still be providing lump sums which, with compound interest, will exactly restore projected, annual losses in future years. Reductions for worklife expectancy, if made in estimating wages, must be added

Table 2
Psychological Assessment of LPL Ratings of Karen Doe

Age	Degree of Impact	Examples
18 (1 yr.)	Catastrophic 90%	Major operation, unable to attend school, inability and difficulty in caring for self and practical activities, normal social life completely disrupted, anxiety, fear, and concern over bodily condition. Steel rods permanently implanted for a period of at least 10-15 years. Body cast.
19-21 (3 yrs.)	Moderate to Severe 45-55%	Unable to participate fully in school life both academically and socially. Unable to lift or carry weight of more than few pounds. Difficulty in getting vigorous physical (aerobic) exercise. Anxiety/fear of being hurt. Self-consciousness about steel rods and brace. Reduced social contact. Emotional dependency on boy friend. Flashbacks about accident and hospitalization.
22-30 (9 yrs.)	Moderate 33-50%	Continued difficulty in lifting weight. Difficulty in caring for young children. Reduced opportunity for marriage partners. Substantial reduction of potential enjoyment in engaging in preferred occupation (modeling). Reduced physical activities, some limitations in social activities.
31-55 (25 yrs.)	Mild to Moderate 24-45%	The quality of Karen's life will depend upon the extent to which she will find satisfaction in meeting normal goals of marriage, family (children) and occupational enjoyment. To the extent she achieves these, the less the impact upon her life.
56-79.7 (24.7 yrs.)	Moderate to Severe 33-67%	As Karen grows older she is more prone to physical traumas from medical complications/physical insults as well as arthritis. The degree of impact will decrease or increase as a function of the interaction between the aging process, her injuries, and her psychological reaction to them. Reduced capacity to function as a grandmother. Possible depression as a function of not being able to meet her life & goals.

unaffected. For ages in which only an LPL estimate is made under an individual avoidance approach, at least a personal maintenance deduction should be made.

In applying the societal value approach, the hedonic loss estimate should have added to it the personal consumption of the average, statistically unknown person before applying the percentages from the LPL scale. What we pay to avoid death takes into account the personal consumption savings resulting from death. In injury, consumption continues.

Finally, the effects of income taxes must now be considered in railroad cases and in a few other jurisdictions. It has been shown that the net of all income tax effects is to raise lump sum estimates of lost earning capacity in many cases (Brady, Brookshire and Cobb, 1983). If income tax effects are to be considered in earning capacity estimates, logic would dictate that such effects must also be considered in LPL estimates. Avoidance earnings would now be after-tax earnings. On the other hand, lump sums would be raised, so that interest could be earned on the lump sum, taxes paid on this substantial interest, and the exact stream of after-tax avoidance losses would result. As with earning capacity estimates, the net of the two income tax effects could raise or lower loss estimates.

VIII. Conclusion

An interdisciplinary approach for applying hedonic valuations to personal injury cases has been conceptually described, as one foundation for future work by forensic economists, psychologists, and related professionals. Juries are permitted, in a number of jurisdictions, to make an award for the loss of the pleasure of life, in addition to the lost value of an individual functioning as an "economic machine." Thus, expert testimony in this area may have a probative value for juries every bit as significant as traditional testimony by forensic economists regarding lost earning capacity.

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back to the second shift wages in order to estimate the most that a person could incrementally earn (and be willing to pay). Similarly, if the fringe benefits have been reduced for worklife expectancy, these reductions for the first shift must be added back under the individual avoidance approach.

Most wrongful death statutes provide for personal consumption deductions from lost earning capacity estimates. The survivors of a deceased household head could only have received his earnings less the dollars which he exclusively consumed for his own benefit (Brookshire and Smith). At least a maintenance-level deduction is also relevant for individual avoidance estimates, as the person working up to 80 weekly hours must spend something on himself to subsist. For ages in which consumption has been deducted from earnings, the LPL estimate is

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Edited by PATRICK A. GAUGHAN

Fairleigh-Dickinson University

ROBERT J. THORNTON

Lehigh University



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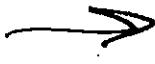
Greenwich, Connecticut

London, England

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LIST OF CONTRIBUTORS

<i>Michael L. Brookshire</i>	Michael Brookshire & Associates Dunbar, West Virginia
<i>Charles W. deSeve</i>	American Economics Group Washington, DC
<i>Everett G. Dillman</i>	International Business Planners El Paso, Texas
<i>Henry A. Einhorn</i>	Maryland Public Service Company Silver Springs, Maryland
<i>Caroll B. Foster</i>	Foster Associates, Incorporated San Francisco, California
<i>Patrick A. Gaughan</i>	Department of Economics and Finance Fairleigh-Dickinson University
<i>Thomas J. Hodson, Jr.</i>	Department of Economics and Finance Fairleigh-Dickinson University
<i>Gerald Olson</i>	Department of Economics University of Missouri—Kansas City
<i>Frank L. Slesnick</i>	Department of Economics Bellarmine College
 <i>Stan V. Smith</i>	Corporate Financial Group, Limited Chicago, Illinois
<i>Robert J. Thornton</i>	Department of Economics Lehigh University
<i>Robert R. Trout</i>	Foster Associates, Incorporated San Francisco, California

HEDONIC DAMAGES IN PERSONAL INJURY AND WRONGFUL DEATH LITIGATION

Stan V. Smith

INTRODUCTION

One of the more difficult tasks facing jurors is to place a dollar value on the loss of enjoyment of life in wrongful death and nonfatal injury cases. Such losses have recently become known as hedonic damages. Over the past several decades, economists have developed techniques to measure intangible damages that are "accurate at least to a reasonable level of approximation."¹ Methodologies developed in the 1970s to measure the value of life can greatly assist fact-finders in performing their task. These techniques and the attendant expert testimony by an economist can provide a framework within which jurors reach their conclusions.

Until recently, all jurors had to rely on ad hoc techniques proposed by defense or plaintiff attorneys at trial as well as their own intuition. As might be expected, this process commonly resulted in widely varying awards. Legal researchers have long argued that this process leads to inflated awards and,

indeed, simple logic could predict this result. In a system where error can be large, errors on the low side cannot cause a result to be less than zero, whereas there is no upper limit to errors on the high side. An upward bias results.

Many people have read of highly publicized jury awards in past years and wondered what process produced the results. Jury reliance upon accepted economic methodologies can produce greater fairness and consistency in awards and not necessarily, as some have argued, higher average awards. As with any expert testimony, the jury decides the weight to be given to this evidence. But the valuation methods that have been developed can serve as a useful guide in aiding the jury in their difficult task of determining intangible losses.²

Damages for the loss of enjoyment of life have become known as hedonic damages. I first used the term "hedonic damages" and the willingness-to-pay approach to valuing life based on economic measurements in 1985 in *Sherrod v. Berry*,³ a U.S. Code, Section 1983, civil rights case. Although new at that time, this basic approach has been used many times since by a rapidly growing number of economists who value the loss of life in wrongful death and injury cases in many states. The trial and appellate courts in *Sherrod v. Berry* adopted the term *hedonic damages* in their written opinions affirming the admissibility of my testimony. The term does not imply a new element of damages, but rather serves to emphasize the new evidentiary approach used to establish the loss of enjoyment of life, based on economic research over the past two decades. It further serves to distinguish between the value of life itself and its accompanying productivity estimates as measured by earnings, household services, and so forth, sometimes collectively referred to as the human capital value. When added together, the hedonic value and the human capital value comprise the whole life value.

The theory of hedonic damages, which compensates for the loss of enjoyment of life, "has moved quietly, case by case, into the mainstream of modern tort law," according to Bodine, former editor and publisher of the *ABA Journal*.⁴ To date, a majority of state and federal courts have ruled that it is a separate element of damages, while a minority of courts have ruled that it is a factor in pain and suffering.⁵ Most jurisdictions allow for the loss of the enjoyment of life in nonfatal injury cases, but there is great variation in the manner in which such losses can be claimed.⁶ Many courts hold that such loss can be included in a claim for disability or for pain and suffering; other courts allow it as a separate element of damages.⁷ Some courts require cognitive awareness by the victim,⁸ others have found awareness to be irrelevant.⁹ As strictly calculated in injury cases, it is the loss of the capacity to experience the ordinary quality of life, distinct from damages representing

the onset of palpable pain, suffering, and mental anguish which may or may not be concomitantly present. A few states, including Georgia, Connecticut, and Mississippi, allow for such hedonic loss claims by a decedent in wrongful death cases. Alaska, Louisiana, and Hawaii have had lower courts allow this element of damages in cases that have not been appealed to higher courts.

The hedonic damages approach raises a number of issues that deserve examination. Some of these deal with the measurement process, whereas others deal with social concerns. Since testimony on the value of life is being increasingly admitted into courts of law, it can be expected that refinements of the basic technology will be forthcoming and that this methodology will become more standardized as it is utilized over time.²

SOCIETY AND THE VALUE OF LIFE

In most civilizations, including contemporary Western civilization, life itself has been held in high esteem. This has been true at least regarding the lives of the rulers, if not of the subjects. The ancient Babylonian Code of the great King Hammurabi provided payments for loss of the value of life. The poetry of most peoples and the constitutions of almost all countries proclaim that life is to be held in the highest regard. While the principle that life itself is valuable is not uniformly upheld in practice, there has been widespread acceptance of this belief. During the second half of the twentieth century, hundreds of millions of people, who formerly lived under autocracies, made a monumental march toward universal individual freedoms and rights, arguably the most important of which is the right to life itself. A great current debate within our own American society is the affordability of continuously increasing expenditures on health and safety and, hence, the continued enjoyment of life of its citizens. This debate is about the value of life itself.

Despite the long held and nearly universal belief that life is sacred, it was only comparatively recently that economists have developed a methodology which would value life and the capacity to enjoy it. Over two hundred years ago, Adam Smith proposed that the value of life can be measured by the value of a person's output.¹⁰ This concept, known as the human capital approach, is still the principal basis for recovery in wrongful death cases in many jurisdictions. For many years, it has been used as an important basis for assessing the costs and benefits of government programs.

The shortcomings of the human capital approach are obvious to any beginning student of economics. By valuing only the lost labor component, this approach implies that people do not derive any utility from their nonworking life. Further, under this approach, the lives of retired people or

of volunteer workers command no value. At any reasonable discount rate, the value of the lives of very young children is very low because the present value of their future earnings is discounted over many years. According to Justice Richard Posner of the 7th Circuit Court of Appeals, courts have "resolved the vexing problem of the proper valuation of life by ignoring it."¹¹ This results in a "systematic underestimation of damages in wrongful death cases."¹² It would be only a matter of time before society's concerns for the life of individuals brought forth a remedy to the situation.

Ironically, it was also Adam Smith who volunteered a principle which is now one basis for measuring the hedonic value of life. Smith argued that a job which has an undesirable characteristic—say risk of death—will pay more than a comparable job which does not.¹³ Smith's compensating wage differential, or wage premium, required by the marginal worker, should persist over time in competitive labor markets. This thesis eventually led to the analysis of wage differentials for jobs with differing risks of death.

Thomas Schelling planned the modern-day seed in the late 1960s by suggesting that to measure the whole value of life, economists should examine the amounts of money that people were willing to pay to avoid or reduce the risk of dying.¹⁴ This is essentially the method implied by Smith's proposition. The general methodology is now referred to as the willingness-to-pay approach. This methodology examines the amounts paid to save (or put at risk) the lives of unknown, statistically average people. Because this process involves low probability events, the results are much more objective than when death is faced with certainty. When actual lives are at certain risk and in sudden, public profile, the amounts paid can be extraordinarily high since society is no longer objectively valuing unknown lives.¹⁵ Thus, in the late 1980s, when Jessica McClure became trapped in an abandoned water well in Texas, and when several whales were trapped in an Alaskan ice floe, the amounts expended implied an enormous value to the life of the child and the whales alike, in those very public circumstances.

Agreeing with Schelling, Linnerooth also concluded that there was no theoretical relationship between the willingness-to-pay and the then widely used, human capital approach to valuing human life.¹⁶ Why should the value of life of a workaholic be greater than that of a person who leads a life of balance among work, family, and community activities merely because the former may earn much more? In fact, it could be argued that the higher earnings come from forgoing much of life's enjoyment.

Our society concerns itself greatly with the saving of statistical lives, some of which, Schelling reminds us, may be our own. The overall logic of the valuation process is simple. If we were to spend \$50 million on a program that prospectively might save fifty lives, the implicit life valuation would be at the rate of \$1 million per person. Many spending programs lower the risk of death and thus place an implicit value on life. Some of them are private

expenditures of monies, while others are public expenditures. Our concern for lifesaving is significant and substantial, internalized in every building, every highway, every airplane, and other such construct.

Concern for lifesaving is inherent in the ways in which our society manages itself. Presidential Executive Order No. 12291 requires agencies to prepare a value-of-life estimate for all significant legislation, and the order recommends the willingness-to-pay approach.¹⁷ There is some puzzlement as to why this information, available since the early 1970s, took almost two decades to be introduced into the courts. The reasons may be several. Formally estimating a price for life is distasteful to some, although jurors are often asked to do so. Our society has a strong belief that life is sacred. However, economists have shown that worldly concerns such as costs already affect our decisions about who shall live and who shall not. The widely varying jury awards arise from the vacuum of information in the courtroom about the value of life. Thus a mix of these and perhaps other forces led to the inevitable introduction to courts, and to jurors, of a broad body of economic research on the value of life. By all accounts of posttrial interviews and the analysis of mock trials, most jurors reported that they welcomed the information. It lowered their initial anxiety when they first heard that they would be charged with putting a dollar value on the loss of enjoyment of life and had no initial idea of how to do so. I believe it provides jurors with one additional guideline or viewpoint, from an economic perspective, which, when coupled with their own moral, philosophical, social, and spiritual viewpoints, serves to assist them in performing their difficult task.

THE VALUE-OF-LIFE LITERATURE

The willingness-to-pay approach is now widely accepted by academic economists as a method for arriving at whole life values. The value that economists measure is the whole value of life, which includes human capital costs. The value of life, net of human capital costs, is what is referred to as the hedonic value of life. While much of the literature was developed to assist in the public decision process, Miller provides clear and convincing evidence that the willingness-to-pay methodology measuring the price of risk reduction meets the so-called Frye¹⁸ test as being "sufficiently established to have gained general acceptance" by academic economists, and that it "should permit expert witnesses to use risk reduction values—and not human capital costs—as the primary basis for their testimony on the value of life."¹⁹ Moreover, in the recent *Daubert* case, the U.S. Supreme Court unanimously ruled that the "general acceptance" requirement of the Frye test was at odds with the "liberal thrust" of the Federal Rules of Evidence (*Daubert v. Merrell Dow Pharmaceuticals*, 113 S.Ct. 2786 [1993]).

The value-of-life literature is based on three types of analyses. One analysis examines the costs of reducing the risk of death through individual consumer investment in safety devices and safe behavior. A second examines the risk compensation paid to workers who work in risky jobs. And a third method surveys people's willingness to spend on their own safety.

One of the early reviews of the published literature was provided by Blomquist.²⁰ From the limited results available at the time, he showed that the ratio of whole life values to human capital values ranged from 2.5:1 to 15:1, ignoring the results from contingent valuation surveys, which constituted the extreme values. Although there is no association necessarily between earnings and the value of life, the ratios point to a stark conclusion: the measurements indicate that the hedonic value of life is the larger part of the whole value of life, greater than the human capital value by a multiple of between 1.5 and 14.

Several other reviews of the literature have been published recently. Gillette and Hopkins report that a majority of federal regulations impose a cost of compliance on regulated entities and on rule-making agencies ranging from \$1.5 million to \$8.5 million per life.²¹ Fisher, Chestnut, and Violette review estimates based on individuals' willingness to pay ranging from \$1.6 million to \$8.5 million, placing more credibility on the lower end of the range.²²

To date, the most comprehensive and sophisticated review of this literature can be found in Miller,²³ who analyzes the results of sixty-seven different estimates by economists of the value of life. After weeding out those studies considered to have flaws and adjusting for several sources of inconsistency, Miller accepts forty-seven of the studies. He concludes that the mean, or average, of the whole life value estimates is approximately \$2.2 million in 1988 after-tax dollars for a person with a thirty-six-year remaining life expectancy. Based on discounted future years and after subtracting for human capital costs and the value of continued financial security, Miller concludes that the annualized hedonic value of life was \$55,000 per year in 1988 after-tax dollars. The ratio of whole life to human capital value is approximately 5:1, within the lower end of the range observed by Blomquist. The standard deviation of the forty-seven estimates is \$650,000, indicating that a majority of the published results fall within between \$1.5 and \$3.0 million. For people who have been wary of the broad range of unadjusted results published in the literature, Miller's results should come as news. This range is not significantly different from the ranges of values that exist in other areas of expert economic testimony such as lost income, household service hours, and so forth.

Perhaps Miller's most important conclusion is that, while any one of the studies may have minor methodological flaws, taken as a whole,

the emergence of a consistent value range from studies using many different approaches and data sets suggests that one methodological concern about individual studies are not of central importance. Although they may produce errors, the errors are not large enough to skew the values obtained.²⁴

Miller asserts that this broad body of literature can credibly serve in court as the basis for measuring the hedonic value of life as well as for the loss of enjoyment of life in nonfatal injury.

Miller also reaches several other important conclusions. First, there was no evidence that degree of risk measured in the studies was correlated with life value; low risk and higher risk events produced similar life values, at relatively low risk levels. This result greatly weakens the criticism that at the low end of the risk range people cannot rationally appreciate different risk levels. Second, the studies of consumer behavior produced almost exactly the same mean or average value as the wage-risk studies, greatly reinforcing the credibility of the results using different approaches. Recent work by Albrecht shows that the value of life should increase as the accepted risk increases to 100 percent, implying an underestimate of the value of life in low risk situations.²⁵

HOW TO VALUE A LIFE IN WRONGFUL DEATH

It is generally recognized that different economists may arrive at somewhat different projections for lost earnings. For example, the calculation could easily vary for a person killed during his or her first year of high school and with no previous earnings history. Economists exercise judgment regarding work life, average earnings, growth, and discount rates. Likewise, economists may differ as to precisely what is the net hedonic value of an average life, but such differences are generally within the general range of differences in other areas of valuation.

For example, Miller's review provides a whole life mean of \$2.2 million, and a hedonic value annualized at \$55,000 per year in 1988 after-tax dollars. The mean is arrived at by giving equal weight to the results of each of forty-seven studies. An equally weighted process to determine a mean is not the sole (nor necessarily the preferred) method for calculating a statistic to estimate the central tendency of life values. There are other estimates of the central tendency. In late 1987 using my own methodology, I estimated the average annualized hedonic value to be \$60,000 in 1988 pretax dollars.

To apply this value to a particular case, adjustments for age, race, and gender are necessary. Say, for example, that a fifty-five-year-old white female has been killed, so that all her enjoyment or value of life has been lost. Her remaining life expectancy is 26.8 years. The present value of \$60,000 per year for 26.8 years using a 0.72 percent net discount rate is approximately \$1,454,000 in 1988 pretax dollars.

From the depositions and trial transcripts I have read, as well as from the conversations I have had with other forensic economists, most economists who testify on hedonic damages start with a whole life value and subtract from that value an assessment of the value of the human capital costs and of household services for a statistical person. Some economists have argued that the value of continued financial security should also be subtracted. This value represents the worth of financial continuity, that is, the value placed on continuing to receive, without interruption, an earnings stream. At present there is no conclusive evidence that such a value should be subtracted; it is arguable that it is already included in a lost wages and benefits valuation.

The methodology for subtracting human capital costs from whole life costs should reflect a conservative approach. It should maintain consistent assumptions about taxation and the characteristics of the statistical person. There are several possible approaches to taking all this into account. Let us examine one simple approach that should provide a generous estimate of the present value of lost production and household services for a statistical person and thus a conservative estimate of the hedonic value of life.

To calculate this, consider, for example, that GNP per capita in 1988 was approximately \$20,000. To this we add the value of household services, which are estimated to be on the order of perhaps 25 percent of GNP. A simple average of worklife expectancies for thirty-one-year-old males and females is approximately twenty-five years. To take into account all human capital values, one might simply double (to be conservative) the current value of GNP per capita, assuming a twenty-five-year work life for the statistically average thirty-one-year-old, using a generously conservative 2 percent discount rate. This produces a human capital value of approximately \$800,000. This value can then be subtracted from the whole life costs to arrive at the hedonic value, which can then be annualized using a life expectancy figure and a discount rate.

Other economists have estimated the human capital costs using somewhat different or more detailed assumptions, but the results are similar. An appropriate adjustment must then be made to value the life of a particular person, taking into account that person's age, race, and gender to determine life expectancy. In presenting this estimate and accompanying testimony, an

economist, in effect, interprets the studies and provides information that can help a jury form its own judgment regarding the net hedonic value based on the estimates published in the literature.

The important contribution of an expert economic witness with a knowledge of the studies in this area of economics lies in assisting a jury to determine the range of values and then to determine how that range is applicable to the case at hand. The evidence that an expert economist presents thus serves as a valuable guideline which jurors can then integrate with their own moral, social, philosophical, and spiritual values to arrive at an appropriate conclusion.

Even when that is done, the juror must then weigh the importance of the evidence that the defendants and plaintiffs present with respect to the quality of life of the individual concerned, the specific circumstances of that victim's life, and her or his ability to enjoy life. An economist can present a probable range of the value of life, but only the jury can take all the additional information into account to decide where in that range a given individual falls. No single study can give the perfect answer as to the value of life; but the preponderance of studies, showing results falling in the \$1.5 to \$3.0 million range, should be viewed as evidence of a consensus as to where to begin.

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THE LOSS OF ENJOYMENT OF LIFE IN NONFATAL INJURY

The process of valuing the lost enjoyment of life in nonfatal injury is based on the hedonic value of life established in the preceding section.²⁷ It involves an interdisciplinary approach using the assessment of a psychologist or psychiatrist and is based on a scale of global functioning such as that found in the Diagnostic and Statistical Manual published by the American Psychiatric Association.²⁸ Miller describes an essentially similar process.²⁹ The

application of the value-of-life literature in the measurement of the loss of enjoyment of life in injury is important. This process measures the value of the decrease in the ability to experience the enjoyment of life to which one would ordinarily look forward. It is separate and apart from palpable pain and the consequent suffering, such as fear, worry, mental disturbances, and humiliation that can accompany the injury.

The reduction in the ability to experience the value of life is based on the total value of life, along with an evaluation by a psychologist, psychiatrist, or other mental health professional, that measures the percentage reduction in the capacity to function and experience life as a whole individual. This evaluation examines the claimant's reduced capacity to function in all areas of life by examining the impact on occupational functioning, social and leisure activities, daily practical living, and his or her internal emotional state. This impact can vary from the time of the incident to the end of life expectancy. It may be severer at the time of injury; it may decline as the injured person recovers and compensates; or it may get worse as the medical consequences are aggravated by physical deterioration as one ages.

Identical injuries will affect people differently. Consider, for example, the difference in the loss of enjoyment of life resulting from the amputation of the tip of a little finger for a twenty-one-year-old concert pianist, as opposed to a twenty-one-year-old economist. Further, an impairment such as the loss of eyesight may lead to similar estimates for the loss of enjoyment of life but may be accompanied by different degrees of pain and suffering. A person who loses his sight through the negligent slip of a scalpel may suffer no palpable pain and suffering, whereas another person who loses sight as a result of a gunshot wound may suffer substantial initial and subsequent pain and suffering. The loss of the capacity to engage in life's ordinary yet challenging experiences is not dependent upon the degree of physical incapacity or the degree of pain, suffering, and mental anguish.

Recently, some standards for rating the percentage of functional disability have been suggested.³⁰ There are numerous possible assessment protocols. Ultimately, the percentage loss figure, however derived, is the psychologist's estimate as to the percent loss of the quality or enjoyment of life, based on his or her training, background, experience, and judgment. Once the percentage of loss has been determined, that reduction can be applied against the full hedonic value of life to arrive at a partial loss estimate.³¹ Using the earlier example, let us assume that the fifty-five-year-old female had not died but had been significantly injured. Further assume that a psychologist rates her as losing 40 percent of her enjoyment of life. The losses would be approximately 40 percent of her total hedonic value, or \$582,000. The loss of capacity need not be constant over time; it can vary. Immediately

after a trauma, the loss may be great. The ability to enjoy life may increase somewhat during the recovery period. Losses may remain constant or may increase toward the end of life expectancy, depending on the impact of the injury.

This interdisciplinary process is analogous to the process whereby a vocational rehabilitation expert estimates the percentage of the impairment of the capacity to earn a wage due to injury. A rehabilitation assessment might conclude that a person's hourly earning capacity has fallen by 25 percent, for example, due to certain physical disabilities. An economist would then apply this estimate to the preinjury earning capacity and thus provide testimony routinely admitted into court. Bovbjerg, Sloan, and Blumstein³² argue that today we have sophisticated knowledge regarding the value that people place on the nonpecuniary aspects of life, and that this information should be used to guide juries and trial judges in their valuations of injuries in order to improve the accuracy and fairness of the awards and to make litigation less expensive and more predictable.

CRITICISM IN APPLYING WHOLE LIFE COSTS TO THE VALUE OF LIFE IN COURT

A number of matters have been raised regarding the use of hedonic testimony in court. The quality of the econometric analysis in this area is not without challenge.³³ Yet many criticisms of the hedonic methodology are no different from criticism that can be applied generally to almost any area of econometric analysis.³⁴ One issue is that the use of statistics to measure life value involves uncertainty. However, statistical uncertainty affects other areas of economic testimony as well. Life expectancy tables, for example, are routinely relied upon by economists and admitted into court even though they do not predict the date of death of a particular person with any great accuracy. Few realize that the chance of dying within a ten-year span on either side of an approximate seventy-five-year life expectancy is less than 50 percent. Yet calculations based on life expectancy tables are rarely challenged as to their degree of precision. Just as the life expectancy tables produce unbiased, fair, neutral, and reasonable estimates, the willingness-to-pay literature in economics establishes within a reasonable degree of precision the value of life for use in the courtroom.³⁵

Another criticism of the hedonic approach is that results are sensitive as to whether researchers use risk perception or actual risk, which could change certain willingness-to-pay results. Slovic, Fischhoff and Lichtenstein³⁶ showed that risks of rare occurrences such as botulism were overestimated and incidents of average or common risks such as stroke were underesti-

mated. Oi,³⁷ however, concludes that people's risk perception is systematically accurate. Miller's estimates are adjusted for, and based on, perceived risk. If, however, workers tend to underestimate the risks they face, as some suggest, this would lead to undercompensation in wage premiums and an underestimate of the values of life. Moreover, since the riskier jobs are taken by people who demand the least risk compensation,³⁸ the values determined through an analysis of wage-risk premiums underestimate the value an average person would place on his or her own life.

Another criticism of the hedonic approach is that the wage-risk premium studies assume labor mobility, whereas some critics have argued that workers lack mobility and are forced to take jobs, irrespective of the risks involved. Ironically, this argument implies that immobile workers are underpaid for risks and that, in a perfect market, the risk premium in their wage would be higher, leading to a higher value-of-life statistic. However, there is a large body of empirical evidence that the American labor force is highly mobile.³⁹ In addition, a sufficient condition for wages to reach equilibrium is that there only need be *some* workers who are willing to move to equalize any wage differentials; general overall labor force mobility is not required.

Linnerooth provides an excellent discussion of several of the issues surrounding the value of life.⁴⁰ First, she discusses the willingness-to-pay method as one which clearly involves "placing a value on the loss of a human life" rather than, as many would argue, merely a measurement limited to valuing changes in the risks of death. Even when conceding that these values are for statistical lives, some economists argue that the values cannot be applied to the lives of real people. Yet these same economists have no difficulty applying the statistically average wage of a high school graduate or the statistically average life expectancy of a ten-year-old white male to a real person. Moreover, when consumers spend money on lifesaving equipment, real lives are saved, notwithstanding the fact that usually we just do not know which lives. The process of applying the same value of life to all people is no different from applying the same statistical high school wage to all prospective high school graduates, or of applying the same life expectancy figures to all ten-year-old boys. Value-of-life estimates are modified by life expectancy in the same way that prospective high school wages are modified by work-life expectancy. There are personal characteristics that are not taken into account in the hedonic value process, but again this is also true in other areas of economic assessment.

Linnerooth also concludes that a person's lifetime earnings are only a lower bound to the willingness to pay. Some critics have stated that the value of life must be limited in some way by the value of production. It should not be surprising, though, that the hedonic value of life is greater than the value

of production, as Blomquist clearly showed. Other critics claim that the amount a person would accept to end his or her life with certainty is infinite. This is of course true; at death the utility of money or of any asset for that matter is zero, excluding the value that someone may place on providing benefits to survivors. We cannot get an objective answer to the value of life from those facing death with certainty. But by examining the mundane behavior of society where the risks to a person are small, we may arrive at an objective result.

Linnerooth also agrees with other researchers that the amount of insurance an individual purchases to insure himself against the loss of his life cannot lead to the appropriate figure for valuing the reduction of the probability of its loss. This conclusion seems obvious when we reflect that wealthy people do not need life insurance, except perhaps to provide liquidity to an estate, whereas poor people cannot afford life insurance. The purchase of life insurance reveals how a person wants his or her survivors to prosper after his or her death; it says nothing about how he or she values his own life since its purchase does not at all affect survival.

Some economists have argued that the value we place on our leisure time and activities is a measure of the value of life. It is not. When we pay \$3 an hour to see a movie, we do not implicitly value life at that rate; this is the price of entertainment. All of us would pay something per hour merely to be alive, to play with our children, to stare at the sun, or even the ceiling. Critics have argued that by engaging in risky activities, a person expresses a low value on his or her own life. However, our engagement in risky activities does not necessarily mean that we do not value life; we frequently engage in risky activities in exchange for a certain pleasure. Scuba divers take risks in order to enjoy underwater exploration. If we wanted to avoid risk at any cost, we would drive Sherman tanks rather than cars, live underground to avoid exposure to the sun's rays, and never eat a banana split.

Some economists believe that the value-of-life results are essentially correct, but should be used only for product liability cases because these values pertain to deterrence and not to compensation. When asked which values jurors should use in a nonproduct liability wrongful death case where compensation for the life of the deceased is allowed, one researcher acknowledged that he would "use the deterrence values" that he derived for other cases as well.⁴¹

Another researcher who questioned the econometric soundness of the values nevertheless indicated that a value-of-life figure in the \$2 million range "sounded about right."⁴² Still, a hesitancy exists among some economists to use these values in death cases because of the belief that these values should not go to survivors, since they are losses experienced by the decedent.⁴³ This

is a legitimate issue for our society to debate. However, where courts do allow for losses by the decedent to be recovered by survivors, it is not the role of an economist to argue against the use of hedonic damages by claiming that this type of recovery is wrong in our society. Moreover, losses due to pain and suffering sustained by fatally injured victims before death, or by permanently comatose victims, are routinely recoverable in most jurisdictions and likewise are received by survivors.

Some defense attorneys argue against the use of such damages, stating that the willingness-to-pay research was not conducted with the express purpose of having these values used in court. This may be true, but researchers frequently do not foresee the uses to which their work will be put, nor are their explicit agreement and consent required. Overall, numerous researchers have explicitly agreed that this body of literature can be used to value life in court, urging proper and cautious use.⁴⁴

Forensic economists will be called upon to testify on hedonic damages with increasing frequency. One commentator advises that such testimony can assist with the proof of the loss and "is worthy of serious consideration for use at trial." He further offers the following guidance to attorneys and economists:

The hedonic value of life is a specialized field in economics. Though many economists are familiar with the concept in general, relatively few have deep expertise. If hedonic loss is a major component of a case, it is probably both effective and cost-efficient to seek out an expert in this specialized area of economics. Furthermore, using someone established in this field will enhance the credibility of the testimony. Without using an economist who is established in this field, as demonstrated for example by articles published in the professional journals, testimony may come across as cooked up for the purpose of getting big numbers before a jury.⁴⁵

before a jury. The FRE constitute a more relaxed standard than the *Frye* test.⁴⁶ The FRE are written so as to be generous in what is allowed in court, relying upon the adversary system of justice and the ability of counsel to present and counter expert testimony. They further rely on the ability of juries to evaluate the testimony. An expert's opinion is thus unlikely to be excluded unless it is unsupported and can offer no assistance to the jury.

The standard of Rule 702 is "helpfulness." The standard set by Rule 703 does not require that the methodology and opinions of the expert be "generally accepted." Rather it requires that the opinion be based on the type of evidence reasonably relied on by experts in that field or discipline. Many courts have ruled that testimony on hedonic damages is helpful to the jury, economists have been admitted in dozens of trials. Of course, the daily life experience and background of jurors are also useful and important in coming to any conclusion. But individuals, industry, and governments expend resources on lifesaving in a profusion of ways in our contemporary American society: vaccines, highways, seat belts, workplace safety, drug labeling, and so on. This information is used by industry and government to manage society in many ways. Without testimony based on this information to guide them, jurors are unlikely to know the average value of life implied by these activities since the published statistical data in peer-reviewed economic journals are not normally accessible to them.

Almost all states allow damages for intangible losses in nonfatal injury cases. In Illinois and elsewhere, economic testimony has been offered and admitted many times in proving the loss of enjoyment of life due to disability in nonfatal injury. A few states, including Mississippi, Georgia, and Connecticut, now allow for the total loss of the enjoyment of life in death cases, as do some federal courts in U.S. Code 42, Section 1983 civil actions.

In a landmark ruling in *Molzof v. United States*,⁴⁹ in his first opinion as a Supreme Court Justice, Justice Clarence Thomas wrote the majority opinion allowing for the loss of enjoyment of life in injury under the Federal Tort Claims Act. *Molzof* struck down the definition of punitive damages under the FTCA as any damages that go beyond compensating for actual pecuniary loss, reversing decisions in the 1st, 4th, 5th, 7th, and 9th U.S. Circuit Court of Appeals that limited damages in FTCA to actual pecuniary loss. Notably, *Molzof* overturned *Flemmery v. United States*,⁵⁰ which held that there must be awareness in order for damages to be meaningful to victims in FTCA cases or else they would be punitive. Punitive damages are not allowed against the federal government under the FTCA. This ruling clearly foreshadows continued expansion of victims' rights to recover for intangible damages and, correspondingly, continued admissibility of testimony that will assist jurors in assessing such damages.

ADMISSIBILITY OF TESTIMONY ON HEDONIC DAMAGES IN COURTS

A number of law review and law journal articles discuss hedonic damages and the admissibility of such testimony.⁴⁶ Courts vary as to whether the loss of enjoyment of life is part of pain and suffering broadly defined, or whether it is a separate element of damages. Courts also vary as to the requirement that the victim be aware of the loss in order to allow for compensation.⁴⁷ The central question is whether information from a broad body of economic research stemming largely from the late 1960s can aid juries in assessing intangible losses. The Federal Rules of Evidence (FRE) adopted by Congress in 1975 allow testimony by an expert with special information that might assist a jury.⁴⁸ The relative weight of the testimony is to be debated

Economic testimony on the loss of the value of life was first admitted in *Sherrod v. Berry*, wherein U.S. District Judge George Leighton discussed at length the basis of his support for economic testimony on an existing element of economic damages, stating that it was "not speculative [but] relevant and material and would aid the jury."⁵¹ The defendants appealed on several grounds, including the admissibility of testimony on hedonic damages. The 7th Circuit Court of Appeals affirmed Judge Leighton's trial court ruling, stating:

It is well settled in this Circuit that Section 1983 permits recovery on behalf of the victim's estate for the loss of the life. The testimony of expert economist Stan V. Smith was invaluable to the jury in enabling it to perform its function of determining the most accurate and probable estimate of the damages recoverable for the hedonic value of Ronald's life.⁵²

The defendants appealed again, and the case was reheard by the entire court, *en banc*. Arguing that it was prejudicial error for the jury to have known that Sherrod was unarmed at the time he was killed, the court reversed the case and vacated the earlier decisions. However, at the rehearing no member of the court questioned the testimony on hedonic damages. Further, writing for the majority, Judge Coffey supported the earlier appellate opinion regarding admitting hedonic damages testimony:

We need not discuss the district court's other evidentiary rulings or jury instructions. We leave these questions for the district court on remand to decide in light of this court's prior discussion of those matters, specifically those found in our *earlier vacated opinion*.⁵³ (emphasis added)

While reversing *Sherrod* on other grounds, the *en banc* court took pains to emphasize its earlier opinion, which referred to the testimony on hedonic damages as "invaluable." Because a discussion regarding the admissibility of the testimony on hedonic damages was a significant part of both the trial and appellate panel opinions, this comment by the *en banc* court must be taken as an endorsement of the trial court's ruling for, and the vacated opinion's affirmation of, the admissibility and value of such testimony.

Over the past five years state courts in Cook County, elsewhere in Illinois, and in over a dozen other states have ruled that the underlying literature is valid, reliable, and scientific and that such testimony is admissible as a useful guide to the jury. Some courts have, however, rejected the testimony claiming a lack of validity and reliability. But as Miller's review of sixty-seven published empirical estimates shows, any significant subset of this literature would show the same result. The studies thus show significant agreement and consensus, establishing the validity and reliability of the estimates.

CONCLUSIONS

The ad hoc valuation methods that juries employ today to determine the loss of enjoyment of life, absent any economic testimony and without reference to objective standards of any sort, virtually ensure that there will rarely be equal justice under the law and that average awards will be inflated. Fairness and efficiency in dispute resolution thereby suffer, and verdicts can vary widely, from niggardly to runaway. Of course judges may compensate for egregious error, but the prospective variation alone leads to higher insurance premiums and higher pretrial settlements.

The win/lose lottery effect of personal injury awards also encourages trials rather than settlements, further adding to litigation and insurance costs. The frequent calls for caps on intangible damages are proof that society does not believe juries can commonly make appropriate awards for intangible damages with the information they currently have at hand. A ceiling on recovery is inferior to an educated jury as a tool for justice. Ceilings expropriate rights of the most grievously injured. Highly variable and sometimes runaway awards are to be expected when courtroom theatrics stirring compassion for either defendant or plaintiff substitute for facts regarding appropriate compensation for intangible losses. We would benefit collectively from more rational and informed jury decisions, with testimony that speaks to jurors' minds as well as their hearts.

Individually and as a society, we place significant value on the challenging and often difficult experience of being alive. Research shows that we routinely trade off life for other assets we value, such as money, pleasure, and convenience, but within limits. The emerging discussions of life value here stirred considerable controversy, as advancements in science do from time to time. Science upset the governing powers when Galileo and others proposed that the earth was not the center of the universe. The work of Newton, Darwin, Einstein, Adam Smith, and others created revolutions that caused further upset.

Measurements now show that, while life may be sacred, it is neither "priceless" nor "invaluable." Life *can* be valued. The inferred price is not only not infinite, but approximately one order of magnitude less than the price of a commercial jet airplane. This thinking is contrary to both our childhood learning and religious values and may partly explain some of the deep opposition to the use of the value of life in courts.

Obtaining a reliable estimate as to the value of life is no longer the question. Although estimates may continue to be refined over time, as in any area of economic statistics, the consensus of the evidence is that we value life

in the low, several million dollar dimension, even after subtracting for earnings and household service values.

A profound injury that has permanently deprived a person of his or her capacity to engage in life, taking into account changes in daily practical living, social and leisure activities, the loss of satisfaction from engaging in the occupations of choice, and the loss of internal emotional well-being, constitutes a significant loss to the victim which can be valued in monetary terms. If it is estimated that the victim has lost approximately 25 percent of the ability to experience life's value, it is an entirely valid, reliable and scientific approach to estimate that this person has lost 25 percent of the total value of the enjoyment of life as an estimate of loss due to permanent disability. For an average person of middle age, this figure could be approximately half a million dollars, apart from lost earnings capacity. Jurors are of course free to adjust or reject these and any other figures.

For many years, courts have admitted testimony by economists following an almost identical process of taking into account vocational rehabilitation disability estimates in forming wage loss estimates. This testimony does not invade the province of a jury. It is meant to serve as an aid, a tool, and a guide; it does not dictate a result. In the final analysis, jurors will take into account much more than the words of an economist or of any expert. By withholding from them the enlightening evidence of the value of life, we may risk unduly rewarding some plaintiffs and impoverishing some defendants. We also risk subsidizing some tortfeasors and depriving fair compensation to some of the victims. This is not a hallmark of justice.

It is inevitable that future research will continue to refine measurements of the value of life. How can this research move toward a more personalized estimate of this value? First, in death cases, research may examine factors that might account for variability in the capacity to enjoy life. A number of factors are candidates for study, including different capacities at different ages, wealth levels, discretionary time, family structure, psychological health, and specific personality factors. Second, research is needed to determine how a person's capacity to enjoy life may vary over time. In injury cases, additional work is needed to understand the different impairment levels, both physical and mental. Further, more research into behavior that compensates for injuries and other factors that affect injury recovery rates could greatly assist juries.

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NOTES

1. Robert Coover and Thomas Ulen, *Law and Economics* (Glenview, IL: Scott, Foresman, 1988), p. 531.
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3. *Sherrard v. Berry*, 629 F. Supp. 159 (N.D.Ill. 1985); *Afem'd*, 827 F.2d 195 (7th Cir. 1987); *Rev'd on other grounds*, 856 F.2d 802 (7th Cir. 1988). For a discussion of this case see Stan V. Smith, "Hedonic Damages in Wrongful Death Cases," *ABA Journal*, 74 (Sept. 1988), 70-74.
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The New Hedonics

Primer for Economists and Attorneys

Reading 31

The Value of Life to Close Family Members: Calculating the Loss of Society and Companionship

by Stan V. Smith

Second Edition

1996

Edited by

John O. Ward
Thomas R. Ireland

Production Editor
Nancy Eldredge

Over the past two decades, the value-of-life literature in economics has developed to the point where it can provide useful guidance to jurors in assisting in the valuation process. Hence it has been used by economists to calculate loss of enjoyment of life damages in personal injury and wrongful death cases. This literature can also serve to provide estimates for the loss of society companionship as a result of the death of a close family member.

This evidentiary approach to measuring the loss of enjoyment of life, called hedonic damages, is arrived at by subtracting human capital values from whole life values. The whole life values are obtained using the value-of-life approach. This approach measures the value of the benefits of investing in safety equipment and safer consumer behavior, as well as instruments provided to workers who undertake risk in the workplace. The literature on the willingness-to-pay and the willingness to accept payment is extensive and well reviewed by Viscusi (1993) and Miller (1990). Measurement problem not fully resolved but are no more acute than in most other areas of forensic economics.

The details of the methodology for calculating the loss of enjoyment of life are rather well-known by now and can be found in Smith (1993, 1990, and 1988), Brookshire and Smith (1992 and 1990), Miller (1990) and elsewhere. Value of life estimates are frequently based on what members of a family spend to safe a life. If a person places a smoke detector in his own bedroom, is expressing a lower-bound to the value of his life in an amount equal to the cost of the detector (purchase price, installation, batteries, etc.) divided by the reduction in the risk of death. If, for example, the detector costs \$25 dollars and reduces the risk of death by 1 chance in 100,000, then the value of life expresses \$2.5 million.

Now, suppose that a detector is placed in the bedroom of a child by a parent who seeks to preserve the society and relationship with that child? What value is expressed? The same value, \$2.5 million. But the is the value to *the family* of the child's life.

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This conclusion has been arrived at by Miller (1989):

"When...individual's survivors may recover for their own loss of enjoyment, whole life costs can again be used to estimate the appropriate level of compensation."

Chestnut and Violette (1990) come to a similar conclusion:

"We conclude that the WTP estimates are potentially useful when the definition of compensation involves putting a dollar figure on non-financial losses to the deceased or to survivors."

The following report shows the loss of Society and Companionship due to the death of 12-year-old girl, Jane Doe, survived by her parents. The losses are calculated from the date of death, January 1, 1990, through to the life expectancy of the parent expected to live the longest, Jane's mother, when Jane would be 48 years old.

The basis for the value of life is a \$2.3 million dollar average value of life in 1998 dollars for a statistically average person. (See Brookshire and Smith, 1990 and 1992 for details). Past growth rates and an assumed future growth rate of 0.69 percent in this value are based on a the growth in wages as a proxy for long-term increase in the average ability-to-pay. A discount rate of 1.97 percent is applied.

January 1, 1996

Mr. Paul Barrister
456 Justice Ave, Ste 50
Chicago, IL 60000

Re: Jane Doe

Dear Mr. Barrister:

You have asked me to calculate the value of relationship or society and companionship sustained by Jane Doe's surviving family, as a result of her death.

Jane Doe was a 12-year-old, Caucasian, female child, who was born on January 1, 1978, and died on January 1, 1990. Jane Doe's remaining life expectancy is estimated at 68.3 years. This data is from the National Center for Health Statistics, *Vital Statistics of the United States, 1991*, Vol. II, Sec. 6, Life Table, Washington: Public Health Service, 1995.

I have reviewed certain materials provided to me including: (1) the depositions of Sue and Tom Doe; (2) an interview with the Doe's; (3) statements from relatives and friends regarding Jane Doe; and (4) the Case Information form.

I have made a number of assumptions for the purposes of calculating these losses, which are explained below. Aside from specific studies cited, my methodology is based on general economic studies on past growth rate and interest rate behavior, as well as studies regarding the value of life.

My estimate of the real growth factor per year is 0.69 percent. This growth rate is based on wage growth data published in monthly issues of the U.S. Bureau of Labor Statistics, *Monthly Labor Review* (Washington, DC: U.S. Government Printing Office), for the real increase in wages from 1974 through 1994.

My estimate of the real discount rate is 1.97 percent. This discount rate is based on the real rate of return on U.S. Treasury bills from 1974 through 1994, published in the *Economic Report of the President*. This rate is consistent with a projection of the long term future rate on these instruments published by Ibbotson Associates, Chicago, in its series *Stocks, Bonds, Bills, and Inflation*. This publication, which I originated, is generally regarded as the most widely accepted source of statistics on the rates of return on investment securities, relied upon by academic and business economists, insurance companies, banks, institutional investors, CPA's, actuaries, benefit analysts, and economists in courts of law. Real growth and discount rates are net of 5.53 percent inflation based on the Consumer Price Index from 1974 through 1994, published in monthly issues of the U.S. Bureau of Labor Statistics, *CPI Detailed Report* (Washington, DC: U.S. Government Printing Office).

Economists have long agreed that life is valued at more than the lost earnings capacity. My model of the value of life provides an estimate based on many economic studies on what we, as a contemporary society, are willing to pay to preserve the ability to live a normal life. The studies examine incremental pay for risky occupations as well as a multitude of data regarding expenditure for life savings by individuals, industry, and state and federal agencies.

My estimate of the value of life is consistent with estimates published in other studies that examine and review the broad spectrum of economic literature on the value of life. Among these is "The Plausible Range for the Value of Life," *Journal of Forensic Economics*, Vol. 3, No. 3, pp. 17-39(1990), by T. R. Miller. This study reviews 67 different estimates of the value of life published by economists in peer-reviewed academic journals. The results, in most instances, show the value of life to range from approximately \$1.6 million to \$2.9 million dollars in 1988 after-tax dollars, with a mean of approximately \$2.2 million dollars. The underlying studies fall into three general groups: (1) consumer behavior and purchases of safety devices; (2) wage risk premiums to workers; and

(3) cost-benefit analyses of regulations. For example, one consumer safety study analyzes the costs of smoke detectors and the lifesaving reduction associated with them. One wage premium studies examine the differential rates of pay for dangerous occupations with a risk of death on the job. Just as workers receive shift premiums for undesirable work hours, workers also receive a higher rate of pay to accept a increased risk of death on the job. A study of government regulation examines the lifesaving resulting from the installation of smoke stack scrubbers at high-sulfur, coal-burning power plants. As a hypothetical example of the methodology, assume that a safety device costs such as airbag costs \$460 and results in lowering a person's risk of premature death by one chance in 5,000. The cost per life saved is obtained by dividing \$460 by the one in 5,000 probability, yielding \$2,300,000.

Tables 1 through 3 show the loss of relationship sustained by Jane Doe's surviving family. The value of preserving the ability to live a normal life is also a measure of the value placed on the loss of relationship or society and compensation by all of society, the great majority of which is captured by close loved ones. Thus, it is an estimate of their value of the relationship with the deceased. Close family members place at least the same or greater value on their relationship with the deceased as compared to statistically unknown persons with whom they have no relationship and for whom the concern for lifesaving is less tangible.

Based on Sue Doe's remaining life expectancy of 36.4 years, my opinion of the loss of the relationship to survivors as a result of the death of Jane Doe is \$2,450,509-Table 3. The loss of the relationship is expected to last until the death of the family member with the longest remaining life expectancy, which in this instance is Sue Doe. This relationship loss includes the pecuniary value of companionship, advice, and guidance. This loss is premised upon a statistically average relationship.

A trier-of-fact may weigh other factors to determine if these estimated losses should be adjusted because of special qualities or circumstances that economists do not as yet have a methodology for analysis.

In each set of tables, the estimated losses are calculated from January 1, 1990, through an assumed trial or settlement date of January 1, 1996, and from that date thereafter. The last table in each set accumulates the past and future estimated losses. These estimates are provided as an aid, tool and guide for the trier-of-fact.

Stan V. Smith
President

Table 1 - Loss of Past Relationship of Jane Doe to Survivors
1990—1995

Year	Age	Relationship	Cumulate
1990	12	\$ 65,646	\$ 65,646
1991	13	68,823	134,469
1992	14	72,326	206,795
1993	15	74,944	281,739
1994	16	77,329	359,068
1995	17	80,181	\$439,249
Jane Doe		\$439,249	

Table 2 - Present Value of Future Relationship of Jane Doe to Survivors
1996—2026

Year	Age	Relationship	Discount Factor	Present Value	Cumulate
1996	18	\$50,734	0.98065	\$79,174	\$79,174
1997	19	81,291	0.96173	78,180	157,354
1998	20	81,852	0.94315	77,199	234,553
1999	21	82,417	0.92493	76,230	310,783
2000	22	82,986	0.90706	75,273	386,056
2001	23	83,559	0.88954	74,329	460,385
2002	24	84,136	0.87235	73,396	533,781
2003	25	84,717	0.85550	72,475	606,256
2004	26	85,302	0.83997	71,566	677,822
2005	27	85,891	0.82276	70,668	748,490
2006	28	86,484	0.80687	69,781	818,271
2007	29	87,081	0.79128	68,905	887,176
2008	30	87,682	0.77599	68,040	955,216
2009	31	88,287	0.76100	67,186	1,022,402
2010	32	88,896	0.74630	66,343	1,088,745
2011	33	89,509	0.73188	65,510	1,154,255
2012	34	90,127	0.71774	64,688	1,218,943
2013	35	90,749	0.70388	63,876	1,282,819
2014	36	91,375	0.69028	63,074	1,345,893
2015	37	92,005	0.67654	62,282	1,408,175
2016	38	92,640	0.66386	61,500	1,469,675
2017	39	93,279	0.65104	60,728	1,530,403

If there is additional data which I have not yet taken into account, please let me know so that I may incorporate new information into a supplement of this analysis.

Sincerely,

Table 2 (cont) - Present Value of Future Relationship of Jane Doe to Survivors 1996—2026

Year	Age	Relationship	Discount Factor	Present Value	Cumulate
2018	40	93,923	0.63846	59,966	1,590,369
2019	41	94,571	0.62613	59,214	1,649,583
2020	42	95,224	0.61403	58,470	1,708,053
2021	43	95,881	0.60217	57,737	1,765,790
2022	44	96,543	0.59053	57,012	1,822,802
2023	45	97,209	0.57912	56,296	1,879,098
2024	46	97,880	0.56794	55,590	1,934,688
2025	47	98,555	0.55696	54,891	1,989,579
2026	48	39,694	0.54620	21,681	2,011,260
Jane Doe				\$2,011,260	

Table 3 - Present Value of Net Relationship of Jane Doe to Survivors 1990—2026

Year	Age	Relationship	Cumulate
1990	12	\$65,646	\$65,646
1991	13	68,823	134,469
1992	14	72,326	206,795
1993	15	74,944	281,739
1994	16	77,329	359,068
1995	17	80,181	439,249
1996	18	79,174	518,423
1997	19	78,180	596,603
1998	20	77,199	673,802
1999	21	76,230	750,032
2000	22	75,273	825,305
2001	23	74,329	899,634
2002	24	73,396	973,030
2003	25	72,475	1,045,505
2004	26	71,566	1,117,071
2005	27	70,668	1,187,759
2006	28	69,781	1,257,520
2007	29	68,905	1,326,425
2008	30	68,040	1,394,465
2009	31	67,186	1,461,651
2010	32	66,343	1,527,994
2011	33	65,510	1,593,504
2012	34	64,688	1,658,192
2013	35	63,876	1,722,088
2014	36	63,074	1,785,142
2015	37	62,282	1,847,424
2016	38	61,500	1,908,924
2017	39	60,728	1,969,652
2018	40	59,966	2,029,618
2019	41	59,214	2,088,832
Jane Doe			

January 30, 1996
Work Notes

Basic Facts: 12-Year-Old Girl Killed In Auto Accident.

Name: Jane Doe

Date Of Death: 1-1-90

Date Of Trial: 1-1-96

Date Of Birth: 1-1-78

Age At Date Of Death: 12.0

Remaining Life Expectancy At Date Of Death: 68.3

Total Life Expectancy At Date Of Death: 80.3

Race/Gender: White Female

Growth Rate: 0.69%

Discount Rate: 1.97%

Family Background

Sue Doe-Mother, Born 1-1-45, Age 45, RLE 36.4

Tom Doe-Father, Born 1-1-40, Age 50, RLE 26.9

Relationship

1990 = 60000 (1988 Base) * 5.71% = 65646

1991 = 65483 * 4.84% = 68823

1992 = 68718 * 5.09% = 72326

1993 = 71294 * 3.62% = 74944

1994 = 74567 * 3.18% = 77328

1995 = 77328 * 3.69% = 80181

Thus Mother's RLE Of 36.4 Years (Age 48.4 For Jane)

Future Growth At .69%

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Hedonic Damages in the Courtroom Setting—A Bridge Over Troubled Waters

Stan V. Smith*

I. Introduction

There is considerable controversy in the legal press regarding the use of so-called hedonic damages testimony to value intangible losses in a litigation setting. The controversy involves the term applied to such damages, their measurement, and their admissibility. Companion papers to this article address the issue of measurement. The underlying measurement techniques have been well-accepted in the field of economics for over two decades, despite an occasional critic now and then. The purpose of this paper is to present what is known about the state of the art regarding the use of such testimony in court by expert witnesses. This paper discusses the origin of the testimony, the framework for its use in a courtroom, the scope of application, and the admissibility.

Some economists and attorneys have lamented my initial use of the term "hedonic damages" to refer to the value of the enjoyment of life beyond the human capital value. In a cogent discussion of the subject of life valuation Miller (1989) argues for an alternative: whole life costs *versus* non-monetary life costs. I concur with his arguments, yet my original term has been widely adopted and seems likely to stick. Thus, I continue with its use here.

II. Origin

In 1964 I was asked to testify regarding certain business losses resulting from the shooting death of a young black, Ronald Sherrod, in Joliet, Illinois. Sherrod operated an automotive repair facility with his father. On December 8, 1989, another young black youth, Gary Duckworth, had stolen some \$50 dollars from a small shop; he dropped the money when the owner pursued him. Duckworth fled on foot to Sherrod's Auto Repair seeking a jump start for his car. Unaware of the theft, Sherrod agreed to assist him. A police officer who heard the thief's description from a radio broadcast saw the two in Sherrod's car. Officer Berry stopped the car, suspecting Duckworth of the theft, and circumstantially, Sherrod, of complicity. Duckworth was never known to commit a violent crime; Sherrod was never known to have been in trouble with the law. When ordered at gunpoint to raise his hands, Sherrod innocently reached into his jacket for his driver's license. Instantly, Berry shot him in the head, killing him. According to the records in three prior incidents, Berry had abused citizens. In testimony at trial, evidence indicated that Joliet had the highest ratio of police shootings per capita measured against all other cities in the U.S.

Sherrod's mother and father originally sought solely to have the name of their son cleared. In the coroner's report Sherrod was referred to as suspect in a robbery. Not only did the evidence prove he was uninvolved in the robbery, he was totally unaware of it at the time he was killed. Chief of Police Frederick Breen refused the persistent and numerous requests by Sherrod's mother to clear his name and change the coroner's report to clear Sherrod's name in the official records. In frustration, Sherrod's parents hired attorneys who filed an action in Federal District Court in Chicago claiming a violation of Section 1983 of United States Code 42, a violation of civil rights. (See *Sherrod v. Berry* 629 F.Supp. 159 (N.D. Ill. 1985), affirmed 827 F.2d 195, *rev'd on other grounds*, 856 F.2d 802 (7th Cir. 1988)). During pre-trial proceedings, plaintiff's attorneys argued that, since the 7th Circuit had twice earlier affirmed awards for the loss of the value of life itself, economic expert witness testimony on the subject should be admitted for the jury's consideration. The trial judge, George Leighton, denied a motion in limine to exclude my testimony on the grounds that it was speculative, saying that the admissibility was "arbitrary" given that the element of damages was allowable in the 7th Circuit. In his court opinion, he wrote that such testimony was relevant and material and enabled the jury to perform its function in determining the proper amount of damages. He reasoned that difficulty in measuring such damages did not make them speculative; that damages are speculative when there is uncertainty as to cause rather than as to measurement or extent. I thus provided the first testimony on hedonic damages in U. S. courts, described in Smith (1988). I summarized the large body of value of life literature for the jury, indicating to them the range of values ranged. I further testified that, according to economic research, the value of life was considerably greater than the human capital measure. I termed this excess over the human capital measurement "hedonic damages", to distinguish it from the lost earnings measure of economic damages. The cross-examination was intense and vigorous. In the end, the jury awarded \$350,000 in hedonic damages, along with \$300,000 in lost business earnings, \$450,000 in loss of society and companionship, and \$1,700 for funeral expenses.

The defendants appealed on several grounds, including the admissibility of testimony on hedonic damages. In a 2 to 1 panel opinion, the 7th Circuit Court of Appeals affirmed the trial court's findings. Judge Cummings wrote:

"... it is well settled in this Circuit that Section 1983 permits recovery on behalf of the victim's estate for the loss of the life."
"The testimony of expert economist Stan V. Smith was invaluable to the jury in enabling it to perform its function of determining the most accurate and probable estimate of the damages recoverable for the hedonic value of Ronald's life."

The defendants appealed again, and the case was reheard *en banc* along with two other cases that called into question the behavior of municipalities. Arguing that it was prejudicial error for the jury to have known that Sherrod was unarmed at the time he was killed, the Court reversed the case and vacated the earlier decisions. At the rehearing, no member of the court questioned the testimony on hedonic damages. Writing for the majority, Judge Coffey supported the earlier appellate opinion regarding hedonic damages:

* Stan V. Smith is Adjunct Professor of Legal Economics at DePaul University College of Law and President of Corporate Financial Group, Ltd., Chicago, IL.

"... we need not discuss the district court's other evidentiary rulings or jury instructions. We leave these questions for the district court on remand to decide in light of this court's prior discussion of those matters, specifically those found in our earlier vacated opinion." (Emphasis added.)

These were the rather controversial circumstances regarding the first use of hedonic testimony. The case was never retried since Sherrod's parents settled with the City of Joliet.

III. Framework in Court

Courtroom evidence about the loss of the value of life can take several forms. Economists might argue for the additional capacity to earn if a decedent were faced with certain death as an alternative. Evidence might be produced as to what it costs to save the lives of specifically known individuals. These estimates include the costs of saving those trapped in life threatening situations; the costs of maintaining prisoners serving life sentences without parole; the costs of maintaining hospital patients who are irreversibly brain dead; and even the costs of saving whales. The problem is that these estimates, while they may have jury appeal, are a subjective measure of what we are routinely willing to pay to save lives. These circumstances are extraordinary and rare; they do not reflect the ordinary process and prices of living.

As a consequence, the most appropriate measure for the value of life is to base it on a wide body of literature measuring the cost-benefit of life saving programs using the willingness-to-pay methodology. Most studies measure the value of life implied by consumer purchases of life saving devices, the value of life implied by the risk premium paid for hazardous jobs, or more controversially, the value of life implied by government regulations. Several summaries of this literature have been published recently, including Miller (1990). In the main these surveys conclude that life is routinely valued in the several million dollar range. These values are whole life values from which certain values must be subtracted before arriving at a net, hedonic value: lost earnings plus fringe benefits minus personal consumption; the loss of household services; and a figure Miller (1989) refers to as the loss of the value of financial security. The net value can then be tailored to the specific individual in various ways, some of which have been suggested by Brookshire and Smith (1990). Undoubtedly more refinement in the methodology is coming. Prime topics may include defining a central tendency of published values (see Miller's companion paper for one attempt), determining appropriate methods for subtracting human capital costs, estimating the value of financial security, determining an appropriate discount rate, and applying the characteristics of the specific victim. Further, consideration must be taken into account if the victim was receiving some compensation for risk on the job, although the consideration may be limited if the risk that produced the fatality was not the result of ordinary conduct, but negligent conduct by another, involving an unforeseen risk.

Defense attorneys and, surprisingly, plaintiff attorneys and a few economists have taken a stand against presenting such evidence in court. Defense economists and attorneys have argued variously against the use of the value of life literature. Among the arguments advanced are that the literature is not precise, the meth-

odologies are flawed, the values measure the price of risk as opposed to the price of life, the price of leisure activities bears on the price of life, no one would sell his life at any price, that life's value is immeasurable; and that the price of life is related to the amount of life insurance.

This section suggests ways to refute these arguments in court. Companion articles to this paper address the issue of measurement. Suffice it to say that I agree with those who consider the risk reduction value the conceptually appropriate value for life, and that the theory is sufficiently well developed to be viewed as conventional methodology according to Miller (1989), the Office of Management and Budget (1989), and numerous other researchers. To maintain that this methodology is not sufficiently mature to use in court is comparable to asserting that Columbus should have never set sail since land satellite technology had yet to prove that the flat earth adherents were wrong. We know that life valuation is in the several million dollar range, not the several hundred thousand dollar nor the several tens of millions of dollars range. We manage our society based on values in this range. We can safely advise jurors to base *ex-post* compensation on such values. Most of the technical arguments about the lack of precision could also be made against lost earnings or other routinely calculated losses. These arguments have been found equally invalid in such circumstances.

Some defense economists argue, either naively or disingenuously, that the appropriate method to value life is to multiply leisure time by the price of leisure activities: \$3 dollars per hour for a movie, or racquet court time costs. Clearly these prices measure what we would pay over alternative, less preferable activities: cleaning closets or standing in queues. They fail to measure the preference for boredom over the alternative of death, a considerable neglect. If asked, the amount we would accept for certain death is, of course, infinite. But we constantly engage in risk taking activities, frequently purely to save money. We drive cars, not Sherman tanks. We sometimes drive home after a drink at a party instead of calling for a taxi. Our behavior is not always consistent, but we can arrive at an average assessment. We may not want to sell our lives at any price, but we place our lives at risk, for money, frequently. We might regard the price of a small unit of risk as comparable to the price of a share of stock. The cost to buy all the shares of a publicly traded company is uniformly in excess of the price of a single share. Thus no one would argue that the price of a single share multiplied by the number of shares outstanding overestimates the fair market value of a corporation. Sometimes we undertake risk for pleasure: sky diving, smoking, scuba diving. These activities do not mean that we do not value our lives or value them less than a more physically conservative person, but rather that we value the pleasure sufficiently to take the risk, much as we value the money we save when we take risk.

Lastly, the value of life insurance has absolutely nothing to do with the value one places on one's own life. This amount of life insurance reflects a combination of what is affordable and a desire to attenuate the financial hardship to survivors. Wealthy people may not need to buy any life insurance unless it is to pay taxes on an otherwise illiquid estate, or to provide special bequests. Poor people may not be able to afford any insurance. Life insurance reflects something about how the insured is able to provide for the well-being of survivors, not his or her own well-being.

Defense attorneys, and ironically some plaintiff attorneys, also argue that such testimony invades the province of the jury. Transcripts of mock trials and interviews with jurors at actual trials in which I have participated reveal that jurors are uniformly receptive to and appreciate such information. The motive of defense attorneys to exclude this testimony seems obvious. But some highly skilled plaintiff attorneys also oppose its use, perhaps because they believe that their powers of persuasion over an uninformed jury will produce better results for them. They may not want a ceiling imposed on the recovery. Surely justice is better served when jurors hear this evidence; otherwise they are left to determine life values based on their own lay opinion. Bovbjerg, Sloan and Blumstein (1990) claim this lack of juror education produces wildly varying awards, high and low, for intangible damages and is a fundamentally unfair aspect of the judicial system. The defense could introduce value of life testimony to promote rational thought in the jury room whenever it is suspected that the jury will likely run away with the pocketbook of the defendant based on the jury's desire to "punish" the tortfeasor. Testimony on hedonic damages based using the will-ingness-to-pay model will provide more predictable jury awards which will lead to more settlements, lower litigation costs and a more efficient judicial system.

IV. Scope of Use

Aside from measuring the value of life in wrongful death, the value of life literature can be used for several other purposes. I have used it to testify on the reduction in the ability to experience the value of life in non-fatal injury and to measure the loss of society and companionship suffered by those close to death and profound injury victims. While I have not thus far done so, I believe that the testimony can be effectively used to weigh the appropriateness of levying punitive damages in product liability.

In measuring the loss of the ability to enjoy life due to injury, the hedonic value of life serves as a basis for assessing the value of the diminution. Berle, Brookshire and Smith (1989), Miller, Calhoun, and Arthur (1989), and Miller, Luchter and Brinkman (1989) discuss the use of this for non-fatalities. Bovbjerg, Sloan and Brinkman (1989) propose mechanisms, based on forming schedules for various types of injuries, in lieu of testimony. The proposed benefit of schedule usage, uniform awards for identical injuries, may present a problem: victims react differently and suffer differently from identical injuries, but each would be awarded "book value". But the concept in estimating the loss is quite simple. Injured parties have not only experienced certain monetary losses, and in many instances palpable pain and suffering as well. They also may have a reduced capacity to experience the value of life. Individuals with a strong sense of self and ego development lose much less capacity to enjoy life after injury than those whose personalities are more frail. To the extent that the reduction in the capacity to experience the former value of living can be measured, the loss can be valued.

Several authors and expert witnesses have argued for the use of whole life values to measure the loss of society and companionship to survivors, and I have had such testimony admitted in state courts. The literature regarding the loss to survivors is much less extensive, yet it is based on whole life costs. A portion

of the whole life costs can serve as a measure to the loss to the family of victims.

Further development of measurement techniques in this area are under way. The use of whole life costs for deciding whether to levy punitive damages is rather clear cut if the data regarding the safety design costs of a product exist. The test of punitive damages is frequently based on whether it is reasonable for the manufacturer to have taken steps which would have avoided the problem. The test of reasonableness includes economic issues. If one can measure the implied cost-benefit of reducing the risk of death in redesigning the product, one can arrive at the value placed on life by the manufacturer. If that value is well above what we as a contemporary American society commonly spend on lifesaving, then a jury could conclude that the manufacturer was not responsible for building in these extra costs. If, however, the product was made with "chewing gum and bailing wire" and could have been made safer at reasonable costs, then the jury could conclude that the manufacturer disregarded the standards of our society and should be made to pay beyond compensation for actual damages.

V. Admissibility

There are two aspects of admissibility. One pertains to economic testimony and the other to the elements of damage that may fall under hedonic damages. Admissibility of testimony is intertwined with the allowable elements of damages, which in turn vary considerably by jurisdiction, cataloged by Brookshire and Smith (1990). To my knowledge, aside from *Sherrod*, no testimony on hedonic damages has yet been the subject of an appellate opinion in any court. Thus the issue of admissibility of testimony could be viewed as largely untested in many jurisdictions at the moment.

While there is no index of states where such testimony has been provided at the trial court level, I have testified in state courts using the value of life model in many courts in many states including Illinois, Florida, Texas, Ohio, Alaska, Louisiana, California, Mississippi, and Indiana. Further, in Section 1983 actions, such testimony was admitted in Federal courts in Illinois and Ohio. My testimony is currently pending in over a dozen other states. The list of states may be longer, counting testimony by others.

Trial courts in a few states have not thus far allowed such testimony. These states include Wisconsin, Missouri, North Dakota and Michigan. A federal district court in Nevada also ruled against admissibility, surprisingly in a Section 1983 action. A number of these cases are on appeal. In a few states, such as Illinois and California, testimony has been ruled inadmissible even though it was admitted in prior trials. Mostly, testimony has been barred because the judge would not allow a claim for the element of damage related to the loss of the pleasure of life to a decedent. At times, where the element of damage was admissible, judges sometimes did not believe that such testimony could assist a jury. Admissibility of such testimony is allowed, I estimate, some 80% of the time.

For wrongful death recovery, the highest court in two states have affirmed the loss of the value of life itself as an element of damage: *Connecticut (Katsatos v.*

Nolan, 170 Conn 637 A.2d 172) and Mississippi (*McGowen v. Estate of Wright*, 524 So. 2d 308, Miss. 1988). Many states including Illinois have no supporting case law, but the jury instructions allow a jury to provide for all losses they deem fair and reasonable. Recoveries for hedonic damages at the lower court level will probably result in state appellate and possibly supreme courts taking up the issue. To the extent that these decisions create controversy, state legislatures may begin to consider the matter. Some states have ruled against recovery for the value of life, arguing that the victim cannot be made whole or that it is too speculative or inappropriate to place a value on life. But such decisions are generally older in the case law. They are giving way to more recent decisions allowing that the loss of enjoyment of life is no more vague or speculative than the intangible losses due to pain and suffering, mental anguish, and disability. Economic research supports the view that these damages are no more difficult to measure than other types of damages to which economists routinely testify.

In non-fatal injury cases requirements differ by state and many decisions depend upon the facts of the case. In Illinois, for example, I testified to the element of damage called "disability" which was the vehicle for recovery in *Ferguson v. West* (87-L-207, Madison Co. Circuit Ct., Illinois). Blum (1988) believes that case was the first in which testimony on hedonic damages was used in an injury case. (It produced a low 7 figure award.) In New York, the highest court ruled in *McDougald v. Garber* (73 N.Y.2d 536 N.E.2d 372 1988) that the loss of the pleasure of life is a part of pain and suffering, not a distinct element of damage. The court further ruled that if there is no awareness of such loss on the part of the victim, recovery is denied. Awareness may not require "consciousness." In New York, hedonic damages for people who have died or been reduced to a vegetative state are thus not currently allowed. There is little other case law support the requirement of awareness in other states, and most states do allow for the reduction in the pleasure of life, either as a separate element of damages, or as part of pain and suffering.

A separate set of issues arise with respect to the admissibility of the element of damages. Firstly, with respect to society and companionship, almost all states allow for recovery by next of kin to decedents and thus it is unusual for a judge to rule against admissibility of testimony. A case that set precedent for admissibility, resulting in a low seven figure award based on testimony I provided in Lake County, Indiana, in early 1990 is *Brock v. Southlake Limousine* (46SD1-8903-CT-00207). With respect to the value of life itself, whether in injury or death, however, admissibility is questionable in many states. The loss of the pleasure of life is more likely to be admissible in injury cases than in death cases. Overall, the general trend on admissibility seems to be for an expansion of allowable damages to include the loss of the value of life both in injury and in death. As the number of jurisdictions that allow for recovery increases, expansion in admissibility of testimony on these issues seems likely. As the demand for such testimony rises, the quality of measurement should become the central focus. Now, a consensus or acceptable range is emerging, as has been the case with real discount rates. With the overwhelming evidence generated over the past two decades, and with more results on the way, the claim that such values cannot be measured has no validity.

VI. Conclusion

Certain social issues arise from this testimony. Some argue that we cannot, as a society, afford to compensate the loss of the value of life. Conceptually, this is a legitimate social issue. On the practical level, one consideration is that the present value of all future personal injury awards, projected reasonably, is less than the present value of the S&L bailout. Such testimony, valuing life in the several million dollar range, may not increase at all the average awards for non-fatal injuries; more predictable awards may lower insurance rates. A second legitimate issue of public debate is whether the estate should receive the loss of life award since the deceased, who suffered the loss, cannot benefit. This issue must be addressed by appellate courts, legislatures, and the population at large. The estate currently does receive awards for pain and suffering prior to death in fatal injury cases. The issue is in some sense related to the issue of who should receive the fines involved in punitive damages, the plaintiffs or the population at risk.

A third issue is whether awards for the full value of life drive certain products from the market. Vaccines, sporting equipment, and birth delivery services are the most frequently cited. The principal issue here is one of liability assessment, not the measurement of damages. We cannot make life a riskless process. It is legitimate to seek strict standards of liability. But when responsibility for damages has been placed on a defendant, a fair measure of such damages, based on economic research, should prevail.

The controversy in the legal world regarding testimony on hedonic damages is understandable. Awarding for the loss of the value of life, the loss in injury and the loss of society and companionship is not new. This area of economic research is not new. But testimony on these elements of loss is relatively new. No one argues that life is not valued at more than the human capital measure, but until recently, juries were left to their own unpredictable estimations of the additional values. One does not have to be a social activist to argue for a better educated jury to determine elements of damages that are already allowable under the law. The use of testimony on hedonic damages increases the likelihood of a fairer jury result. This is an outcome we could all live with.

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